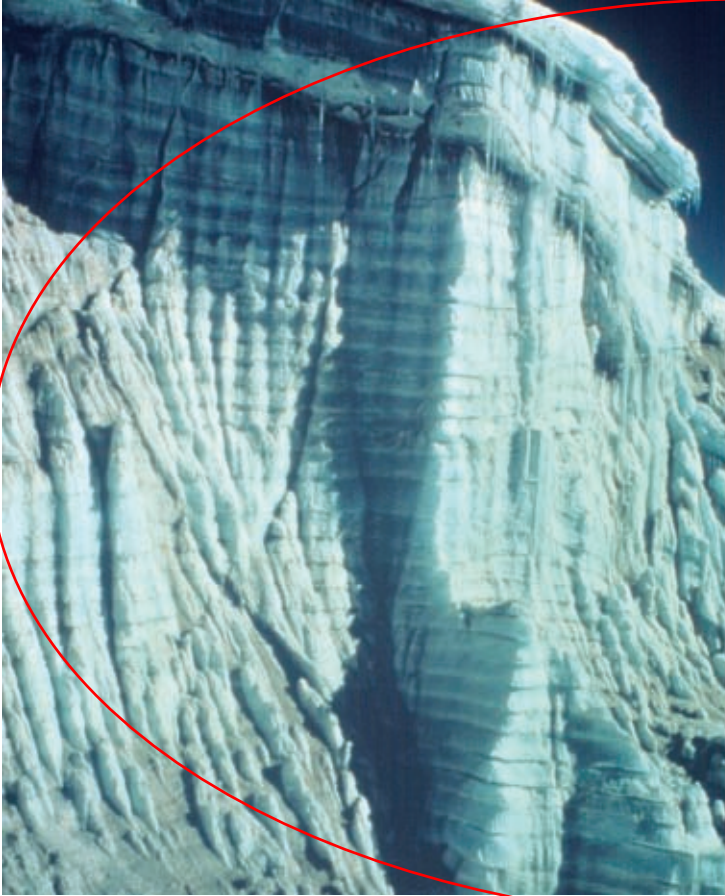


1977



2002



obtained from the Antarctic ice sheet, revealing the composition and temperature of the atmosphere at the time that the snow fell.

Globally, most small glaciers and ice caps are receding, especially those in the lower latitudes where temperatures are already closer to the freezing point than they are in high-Arctic regions. The smaller glaciers and ice caps are excellent indicators of regional and global climate change because they can respond to climate change on a relatively short time scale (years to decades). The larger glaciers and ice masses actually influence regional climate because the highly-reflective snow surface reflects much of the incoming solar radiation back to space where it is not available to heat the Earth's surface.

Throughout most of the 20th century, and previous to that, the only way to study glaciers was to visit them, often trekking through dangerous territory and in harsh conditions, and spending countless days and weeks making measurements. Research is still being conducted in this way, although the use of helicopters has made many glaciers more accessible. However in the last 30 years or so satellite measurements have augmented the field measurements revealing a wealth of information, much of which is not possible to obtain in the field. Together, field and satellite-based measurements allow us to measure precise changes in the areal extent and even the thickness of small glaciers, ice caps, and ice sheets, and to study these changes in the context of the Earth's climate.



Quelccaya ice cap, Peru, the largest single glacier in the Peruvian Andes. The photograph on the left was taken in 1977, and the photograph on the right was taken in 2002, from the same place, demonstrating a dramatic recession. (Photographs by Lonnie G. Thompson, Byrd Polar Research Institute, Ohio State University.)



Party at Muir Glacier in 1897. Lila Vanderbilt Sloane (second from the left) was the mother of William O. Field, and her parents are on either side of her. (LaRouche photo, Seattle, photograph courtesy J. O. Field.)